MEDIA ON DEMAND TITLE INDEXING SYSTEM

CROSS-REFERENCE TO RELATED APPLICATIONS

This application is a continuation-in-part of Application No. 9/590,488, filed on June

5   9, 2000, and claims the benefit of U.S. Provisional Application No. 60/214,987, filed on

June 29, 2000, both of which are entirely incorporated herein by reference.

FIELD OF THE INVENTION

This invention relates in general to television systems, and more particularly, to the

10   field of media-on-demand.

BACKGROUND OF THE INVENTION

With recent advances in digital transmission technology, cable television systems are

now capable of providing much more than the traditional analog broadcast video. In

15   implementing enhanced programming, the home communication terminal ("HCT"),

otherwise known as the settop box, has become an important computing device for accessing

video services and navigating a subscriber or user through a maze of available services. In

addition to supporting traditional analog broadcast video functionality, digital HCTs (or

"DHCTs") now also support an increasing number of two-way digital services such as video-

20   on-demand.

Typically, a DHCT is connected to a cable or satellite television network and includes

hardware and software necessary to provide the functionality of the digital television system

at the client's site. Preferably, some of the software executed by a DHCT is downloaded

and/or updated via the cable television network. Each DHCT also typically includes a

25   processor, communication components and memory, and is connected to a television or other

display device, such as a personal computer. While many conventional DHCTs are stand-

alone devices that are externally connected to a television, a DHCT and/or its functionality

may be integrated into a television or personal computer, as will be appreciated by those of

ordinary skill in the art.

30   DHCTs are capable of providing users with a very large number and variety of

purchasable media rentals and/or non-purchasable on-demand media. Given the vast number

of years that film and television studios have produced movies, television programs and audio

programs, copious media titles can be offered for on-demand viewing from the convenience

of a consumer's home. As the number of available on-demand media titles increases, it can

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become inconvenient and time consuming for users to search or browse through available media titles. Therefore there exists a need to make it easier and more convenient for users to search and browse through available media titles.

SUMMARY OF THE INVENTION

The present invention can be viewed as a method for providing media information to a user via an interactive media services client device coupled to a programmable media services server device. The method for providing media information includes presenting an interactive media guide to a user, receiving user input identifying an indexing prompt displayed in the media guide, and then providing the user with media titles corresponding to an indexing parameter associated with the indexing prompt identified by the user.

BRIEF DESCRIPTION OF THE DRAWINGS

The invention can be better understood with reference to the following drawings. The components in the drawings are not necessarily drawn to scale, emphasis instead being placed upon clearly illustrating the principles of the present invention. In the drawings, like reference numerals designate corresponding parts throughout the several views.
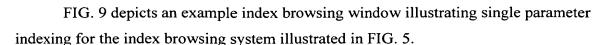
FIG. 1 is a block diagram of a cable television system in accordance with one preferred embodiment of the present invention.

FIG. 2 is a diagram of the headend 11 as depicted in FIG. 1.

FIG. 3 is a block diagram of a DHCT and related equipment, in accordance with one preferred embodiment of the present invention depicted in FIG. 1.

FIG. 4 is a remote control device that can be used to provide user input to the DHCT shown in FIG. 3.

FIG. 5 depicts an example index browsing window, that is presented to the user by the DHCT illustrated in FIG. 3, illustrating an index browsing system.

FIG. 6 depicts an example window, that is presented to the user by the DHCT illustrated in FIG. 3, illustrating an index scrolling feature of the index browsing system of FIG. 5.

FIG. 7 depicts an example index browsing window illustrating a jump-scrolling feature of the index browsing system illustrated in FIG. 5.

FIG. 8 depicts an example index browsing window illustrating an alternative embodiment to the index browsing system illustrated in FIG. 5.

FIG. 9 depicts an example index browsing window illustrating single parameter indexing for the index browsing system illustrated in FIG. 5.

FIG. 10 depicts an example index browsing window illustrating variable range indexing for the index browsing system illustrated in FIG. 5.

5   FIG. 11 depicts an example window, that is presented to the user by the DHCT illustrated in FIG. 3, illustrating indexing criteria options.

FIG. 12 depicts an example index browsing window, that is accessed via the example window illustrated in FIG. 11, illustrating index browsing by year of release.

FIG. 13 depicts an example index browsing window illustrating a jump-scrolling

10   feature of the index browsing illustrated in FIG. 12.

FIG. 14 depicts an example index browsing window illustrating variable time period indexing prompts for the index browsing system illustrated in FIG. 12.

FIG. 15 depicts an example window, that is presented to the user by the DHCT illustrated in FIG. 3, illustrating browse-by categories and indexing criteria options.

15   FIG. 16 depicts an example index browsing window, that is accessed via the example window illustrated in FIG. 15, illustrating a selected category of media titles that is indexed in accordance with a selected indexing criterion.

FIG. 17 is a diagram of an example control menu window for a system operator to configure the headend illustrated in FIG. 2 to determine if and how an index browsing system

20   will be implemented.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

The present invention now will be described more fully hereinafter with reference to the accompanying drawings, in which preferred embodiments of the invention are shown.

25   This invention may, however, be embodied in many different forms and should not be construed as limited to the embodiments set forth herein; rather, these embodiments are provided so that this disclosure will be thorough and complete, and will fully convey the scope of the invention to those skilled in the art.

The present invention is generally implemented as part of a cable television system

30   (CTS). Hence, an illustrative CTS 10 and its operation will be described initially. FIG. 1 shows a block diagram view of a CTS 10, which is generally a high quality, reliable and integrated network system that features video, audio, voice and data services to DHCT users. Although FIG. 1 depicts a high level view of a CTS 10, it should be appreciated that a plurality of cable television systems can tie together a plurality of regional networks into an

integrated global network so that DHCT users can receive content provided from anywhere in the world.

The CTS 10 delivers broadcast video signals as digitally formatted signals in addition to delivering traditional broadcast analog video signals. Furthermore, the system can support one way broadcast services as well as both one-way data services and two-way media and data services. The two-way operation of the network allows for user interactivity with services, such as Pay-Per-View programming, Near Video-On-Demand (NVOD) programming according to any of several known NVOD implementation methods, View-on-Demand (VOD) programming (according to any of several known VOD implementation methods), and interactive applications, such as Internet connections and interactive media Guide (IMG) applications.

The CTS 10 also provides the interfaces, network control, transport control, session control, and servers to access content and services, and distributes content and services to DHCT users. As shown in FIG. 1, a typical CTS 10 comprises a headend 11, hubs 12, an HFC access network 17, and users' digital home communication terminals (DHCTs) 16. It should be appreciated that although a single component (e.g. a headend) is illustrated in FIG. 1, a CTS 10 can feature a plurality of any one of the illustrated components or may be configured with alternative embodiments for any one of the individual components or with yet other additional components not enumerated above. A content provider (not shown) transmits media content to a headend for further transmission to users downstream in the network.

Content provided by a content provider is communicated by the content provider to one or more headends 11. From those headends the content is then communicated over a communications network 18 that includes a plurality of HFC access networks 17 (only one HFC access network 17 is illustrated). The HFC access network 17 typically comprises a plurality of HFC nodes 13, each of which may serve a local geographical area. The hub 12 connects to the HFC node 13 through a fiber portion of the HFC access network 17. The HFC node 13 is connected to a tap 14 which is connected to a network interface unit (NIU) 15 which is connected to a DHCT 16. The NIU 15 is normally located at a user's property and provides a transparent interface between the HFC node 13 and the users' internal wiring. Coaxial cables are typically used to couple nodes 13, taps 14 and NIUs 15 because the electrical signals can be easily repeated with radio frequency (RF) amplifiers.

As the high-level operations of many of the functions of CTSs 10 are well known to those of skill in the art, further description of the overall CTS 10 of FIG. 1 will not be

contained herein. It will be appreciated, however, that the CTS 10 shown in FIG. 1 is merely illustrative and should not be construed as implying any limitations upon the scope of the present invention.

FIG. 2 is a block diagram of portions of a headend 11 that is configured to provide

5   media-on-demand (MOD) services in accordance with one embodiment of the present invention. MOD services include, among other things, video-on-demand (VOD) services and respective MOD information suitable to be presented to a user via display of an interactive media guide. MOD server application 19 and a plurality of other server applications 20 are connected to a digital network control system (DNCS) 23 via a high-speed network such as

10   an Ethernet connection 32. The MOD server application 19 is responsible for reserving and configuring system resources needed to provide MOD services and for providing configuration and service data to an MOD client application 63 (FIG.3), including MOD information comprising a catalog of titles available for on-demand viewing and/or on-demand rental by a user.

15   The DNCS 23 provides complete management, monitoring, and control of the network's elements and broadcast services provided to users. In one implementation, the DNCS 23 uses a data insertion multiplexer 29 and a data QAM 30 to insert in-band broadcast file system (BFS) data into an MPEG-2 transport stream that is broadcast and received via DHCT's communication interface 42 and tuner system 45. The DNCS 23 also contains a

20   session manager 34 that uses Digital Storage Media Command and Control (DSMCC) protocol to set up and maintain MOD sessions. The session manager 34 processes user to network (U-N) session signaling messages, manages allocation of session-related network resources, supports network management operations, acts as a point of contact to the network for the DHCT's 16 in the network 18 to establish individual sessions, and supports MOD

25   services by providing the signaling interface to establish, maintain and release client initiated exclusive sessions.

A service application manager (SAM) server 25 is a server component of a client-server pair of components, with the client component being located at the DHCT 16. Together, the client-server SAM components provide a system in which the user can access services, which

30   are identified by an application to run and a parameter, such as particular data content, specific to that service. The client-server SAM components also manage the life cycle of the applications on the system, including the definition, activation, and suspension of services they provide and the downloading of the applications into the DHCT 16 as necessary.

Applications on both the headend 11 and the DHCT 16 can access the data stored in a broadcast file system (BFS) server 28 in a similar manner to a file system found on operating systems. The BFS server 28 is a part of a broadcast file system that has a counterpart BFS client module 43 (FIG. 3) in a DHCT 16 connected to the network 18. The BFS server 28

5   repeatedly sends data for applications on a data carousel (not shown) over a period of time in cyclical repeated fashion so that a DHCT 16 that is in need of reading any particular data file or parts thereof may receive it when requested by a user or one or more of its internal running processes.

A VOD content manager 21 is responsible for managing the content on the VOD content

10   servers 22. The MOD server application 19 controls both the VOD content manager 21 and the VOD content servers 22 and utilizes them to help deliver the video and audio streams that make up VOD services. In one embodiment, an MOD content manager and MOD content servers (not shown) could run respectively in parallel to the VOD content manager 21 and VOD content servers 22 to manage other types of on-demand media content. In an alternate embodiment an

15   MOD content manager replaces the VOD content manager 21 and the MOD content servers replaces the VOD content servers 22. The QAM modulators that comprise the QAM group 24 receive the MPEG-2 transport streams from the VOD content servers 22, convert them into encrypted RF signals at a specified frequency (channel), and transmit them to a DHCT 16 via the network 18.

20   The QPSK modem 26 is responsible for transporting the out-of-band IP (internet protocol) datagram traffic between the distribution headend 11 and a DHCT 16. Data from the QPSK modem 26 is routed by headend router 27 within the headend 11. The headend router 27 is also responsible for delivering upstream application traffic to the various server applications 19 & 20.

25   FIG. 3 is a block diagram illustrating a DHCT 16 that is coupled to a headend 11 and to a television 41. Some of the functionality performed by applications executed in the DHCT 16 (such as the MOD client application 63) may instead be performed at the headend 11 and vice versa. A DHCT 16 is typically situated at a user's residence or place of business and may be a stand alone unit or integrated into another device such as, for example, a television set or a

30   personal computer. The DHCT 16 preferably includes a communications interface 42 for receiving signals (video, audio and/or other data) from the headend 11 through the network 18 and for providing any reverse information to the headend 11 through the network 18. The DHCT 16 further includes at least one processor 44 for controlling operations of the DHCT 16, an RF output system 48 for driving the television display 41, and a tuner system 45 for tuning

into a particular television channel to be displayed and for sending and receiving various types of data or media from the headend 11. The tuner system 45 includes, in one implementation, an out-of-band tuner for bi-directional quadrature phase shift keying (QPSK) data communication and a quadrature amplitude modulation (QAM) tuner for receiving television signals.

5   Additionally, a receiver 46 receives externally-generated information, such as user inputs or commands from other devices.

The DHCT 16 may also include one or more wireless or wired interfaces, also called ports, for receiving and/or transmitting data to other devices. For instance, the DHCT 16 may feature USB (Universal Serial Bus), Ethernet (for connection to a computer), IEEE-1394 (for

10   connection to media devices in an entertainment center), serial, and/or parallel ports. The user inputs may, for example, be provided by a computer or transmitter with buttons or keys located either on the exterior of the terminal or by a hand-held remote control device or keyboard that includes user-actuated buttons.

In one implementation, the DHCT 16 includes system memory 49, which includes flash

15   memory 51 and dynamic random access memory (DRAM) 52, for storing various applications, modules and data for execution and use by the processor 44. Basic functionality of the DHCT 16 is provided by an operating system 53 that is primarily stored in flash memory 51. Among other things, the operating system 53 includes at least one resource manager 67 that provides an interface to resources of the DHCT 16 such as, for example, computing resources.

20   One or more programmed software applications, herein referred to as applications, are executed by utilizing the computing resources in the DHCT 16. Applications stored in flash memory 51 or DRAM 52 are executed by processor 44 (e.g., a central processing unit or digital signal processor) under the auspices of the operating system 53. Data required as input by an application is stored in DRAM 52 or flash memory 51 and read by processor 44 as need be

25   during the course of the application's execution. Input data may be data stored in DRAM 52 by a secondary application or other source, either internal or external to the DHCT 16, or possibly anticipated by the application and thus created with the application at the time it was generated as a software application, in which case it is stored in flash memory 51. Data generated by an application is stored in DRAM 52 by processor 44 during the course of the application's

30   execution. DRAM 52 also includes application memory 70 that various applications may use for storing and/or retrieving data.

An application referred to as navigator 55 is also resident in flash memory 51 for providing a navigation framework for services provided by the DHCT 16. The navigator 55 registers for and in some cases reserves certain user inputs related to navigational keys such as

channel increment/decrement, last channel, favorite channel, etc. The client applications may be resident in flash memory 51 or downloaded into DRAM 52. The navigator 55 also provides users with television related menu options that correspond to DHCT functions such as, for example, providing an interactive program guide, blocking a channel or a group of channels

5 from being displayed in a channel menu, and displaying a video-on-demand purchase list.

The flash memory 51 also contains a platform library 56. The platform library 56 is a collection of utilities useful to applications, such as a timer manager, a compression manager, a configuration manager, an HTML parser, a database manager, a widget toolkit, a string manager, and other utilities (not shown). These utilities are accessed by applications via

10 application programming interfaces (APIs) as necessary so that each application does not have to contain these utilities. Two components of the platform library 56 that are shown in FIG. 3 are a window manager 59 and a service application manager client (SAM) 57.

The window manager 59 provides a mechanism for implementing the sharing of the screen regions and user input. The window manager 59 on the DHCT 16 is responsible for, as

15 directed by one or more applications, implementing the creation, display, and de-allocation of the limited DHCT 16 screen resources. It allows multiple applications to share the screen by assigning ownership of screen regions, or windows. The window manager 59 also maintains, among other things, a user input registry 50 in DRAM 52 so that when a user enters a key or a command via the remote control device 80 or another input device such as a keyboard or mouse,

20 the user input registry 50 is accessed to determine which of various applications running on the DHCT 16 should receive data corresponding to the input key and in which order. As an application is executed, it registers a request to receive certain user input keys or commands. When the user presses a key corresponding to one of the commands on the remote control device 80, the command is received by the receiver 46 and relayed to the processor 44. The

25 processor 44 dispatches the event to the operating system 53 where it is forwarded to the window manager 59 which ultimately accesses the user input registry 50 and routes data corresponding to the incoming command to the appropriate application.

The SAM client 57 is a client component of a client-server pair of components, with the server component being located on the headend 11. A SAM database 60 in DRAM 52 includes

30 a data structure of services and a data structure of channels that are created and updated by the headend 11. Many services can be defined using the same application component, with different parameters. Examples of services include, without limitation and in accordance with one implementation, presenting television programs (available through a WatchTV application 62), pay-per-view events (available through a PPV application 64), digital music (not shown), media-

on-demand (available through an MOD application 63), and an interactive program guide. In general, the identification of a service includes the identification of an executable application that provides the service along with a set of application-dependent parameters that indicate to the application the service to be provided. As a non-limiting example, a service of presenting a

5   television program could be executed with a set of parameters to view HBO or with a separate set of parameters to view CNN. Each association of the application component (tune video) and one parameter component (HBO or CNN) represents a particular service that has a unique service I.D. The SAM client 57 also interfaces with the resource manager 67, as discussed below, to control resources of the DHCT 16.

10   Application clients can also be downloaded into DRAM 52 at the request of the SAM client 57, typically in response to a request by the user or in response to a message from the headend. In this non-limiting example DRAM 52 contains a media-on-demand application (MOD) 63, an e-mail application 65, and a web browser application 66, among others (not shown). It should be clear to one with ordinary skill in the art that these applications are not

15   limiting and merely serve as examples for this present embodiment of the invention. Furthermore, one or more DRAM based applications may, as an alternative embodiment, be resident in flash memory 51. These applications, and others provided by the cable system operator, are top level software entities on the network for providing services to the user.

In one implementation, applications executing on the DHCT 16 work with the

20   navigator 55 by abiding by several guidelines. First, an application utilizes the SAM client 57 for the provision, activation, and suspension of services. Second, an application shares DHCT 16 resources with other applications and abides by the resource management policies of the SAM client 57, the operating system 53, and the DHCT 16. Third, an application handles situations where resources are only available with navigator 55 intervention. Fourth,

25   when an application loses service authorization while providing a service, the application suspends the service via the SAM (the navigator 55 will reactivate an individual service application when it later becomes authorized). Finally, an application client is designed to not have access to certain user input keys reserved by the navigator (i.e., power, channel +/-, volume +/-, etc.).

30   The MOD client application 63 provides the user with lists of available media titles to choose from and with video presentations requested by the user. The MOD client application 63 provides video presentations to the user by engaging, preferably, in a direct two-way IP (Internet Protocol) connection with VOD content servers 22 (FIG. 2). The MOD client application 63 is also responsible for providing indexing functionality as described below. In an

alternative embodiment, the indexing functionality is provided by a separate application that can be selectively aggregated to the MOD client application 63 for purposes of charging separately for that functionality.

An executable program or algorithm corresponding to an operating system (OS)

5 component, or to a client platform component, or to a client application, or to respective parts thereof, can reside in and execute out of DRAM 52 and/or flash memory 51. Likewise, data inputted into or outputted from any executable program can reside in DRAM 52 or flash memory 51. Furthermore, an executable program or algorithm corresponding to an OS component, or to a client platform component, or to a client application, or to respective parts

10 thereof, can reside in flash memory 51, or in a local storage device connected to DHCT 16 and be transferred into DRAM 52 for execution. Likewise, data input for an executable program can reside in flash memory 51 or a storage device and be transferred into DRAM 52 for use by an executable program or algorithm. In addition, data outputted by an executable an program can be written into DRAM 52 by an executable program or algorithm and be

15 transferred into flash memory 51 or into a storage device for storage purposes. The present invention is not limited by where or how data and/or applications are stored or retrieved.

Each of the above mentioned applications comprises executable instructions for implementing logical functions and can be embodied in any computer-readable medium for use by or in connection with an instruction execution system, apparatus, or device, such as a

20 computer-based system, processor-containing system, or other system that can fetch and execute the instructions. In the context of this document, a "computer-readable medium" can be any means that can contain, store, communicate, propagate, or transport the program for use by or in connection with the instruction execution system, apparatus, or device. The computer readable medium can be, for example but not limited to, an electronic, magnetic,

25 optical, electromagnetic, infrared, or semiconductor system, apparatus, device, or propagation medium. More specific examples (a non-exhaustive list) of the computer-readable medium would include the following: an electrical connection (electronic) having one or more wires, a portable computer diskette (magnetic), a random access memory (RAM) (electronic), a read-only memory (ROM) (electronic), an erasable programmable read-only memory (EPROM or

30 Flash memory) (electronic), an optical fiber (optical), and a portable compact disc read-only memory (CDROM) (optical). Note that the computer-readable medium could even be paper or another suitable medium upon which the program is printed, as the program can be electronically captured, via for instance optical scanning of the paper or other medium, then

compiled, interpreted or otherwise processed in a suitable manner, and then stored in a computer memory.

FIG. 4 illustrates a non limiting example of a remote control device 80 that is used to provide user input to the DHCT 16. The arrow buttons 82 include an up arrow button 83, a down arrow button 84, a left arrow button 85, and a right arrow button 86 that are used to scroll through options and/or to highlight an option. The select button 87 may be used to select a currently highlighted option that is provided to the user. Many alternative methods of providing user input may be used including a remote control device with different buttons and/or button layouts, a keyboard device, a voice activated device, etc. The invention described herein is not limited by the type of device used to provide user input.

With continued reference to FIGS. 3 and 4 throughout the remaining figures, FIG. 5 depicts an example index browsing window 100 illustrating an index browsing system. As with other window examples discussed below, processor 44 executes program instructions of MOD client application 63 that cause it to direct the window manager 59 to create window 100 via display data that is formatted for television 41. Processor 44 stores the display data or parts thereof in DRAM 52 (as necessary) and transfers the display data to a display output system such as RF output system 48 wherein display data is converted to respective television signals and transmitted to television 41. Of course, the scope of the invention also includes any other method of causing the described windows to appear to the user.

The example window 100 in the preferred embodiment fills the entire television screen, but could also be a window composed on part of the television display over top of other windows. The window 100 contains a top portion 101 that typically contains a window heading and a bottom portion 102 that typically illustrates a few relevant navigation buttons available on the remote control device 80. For example, a "C" button 90 on the remote control device 80 can be activated to change the indexing criterion used by the MOD client application 63 as discussed below. Title list 107 contains a list of media titles for the selected category 126 that the user is browsing. In this case "Featured Movies" is some subset of media titles that the system operator has placed in a "Featured Titles" category. Other categories include but are not limited to drama, comedy, action, sports, new releases, etc. Browsing symbol 114 suggests to the user that the user may use the up and down arrow buttons 83, 84 on the remote control device 80 to browse the title list 107 and that the user may use the select button 87 to request a media title shown in a highlighted title area 109. Information section 111 contains information related to a media title shown in the highlighted title area 109.

Indexing portion 103 contains indexing prompts, such as indexing prompt 104, and a highlighted indexing area 105. The highlighted indexing area 105 shows an indexing prompt 106 containing an indexing parameter that corresponds to a designated criterion of the media title contained in the highlighted title area 109. In this example, indexing prompt "A-C" 106 includes indexing parameter "A" which corresponds to the first alphanumeric character of the media title initially displayed in highlighted title area 109. If the title list 107 were to include a title beginning with a numeral, then an indexing prompt associated with such numeral would be shown in the indexing portion 103 as illustrated in FIG. 10. In one embodiment, indexing portion 103 is only displayed if the number of media titles associated with title list 107 is greater than a predetermined indexing threshold, as discussed in more detail below.

A user may activate the up and down arrow buttons 83, 84 on the remote control device 80 in order to cause another media title to be displayed in the highlighted title area 109. A user may request a highlighted media title by activating the select button 87 on the remote control device 80. For example, a user may select the media title X-men 108 via index browsing window 100 (FIG. 5) by using the up arrow 83 on the remote control device 80 to cause the media title X-men 108 to become the media title displayed in the highlighted title area 109, as illustrated in FIG. 6, and by then activating the select button 87. In an alternative embodiment, activating the up arrow button on the remote control device 80 would cause the title "X men" 108, for example, to become highlighted without being shifted down into title area 109, which is thereafter no longer highlighted. In other words, the alternative embodiment would involve shifting the highlighted area rather that shifting the media title list, at least until the top or bottom title shown in title list 107 is highlighted.

FIG. 6 depicts an example window 110 illustrating the responsiveness of indexing prompts to changes in the title list 107. By the user activating the up arrow 83 on the remote control device 80 while being presented with the index browsing window 100 (FIG. 5), the title X-men 108 is displayed in the highlighted title area 109 and the indexing prompts are scrolled such that indexing prompt "X-Z" 104 is displayed in the highlighted indexing area 105 and indexing prompts "A-C" 106 and "U-W" 114 are displayed to the right and left respectively of the highlighted indexing area 105. In this manner, an alphanumeric character belonging to an indexing prompt shown the highlighted indexing area 105 corresponds to the first character of the media title that is be displayed in the highlighted title area 109.

FIG. 7 depicts an example index browsing window 120 illustrating a jump-scrolling feature of the index browsing system illustrated in FIG. 5. After the user activates the right arrow button 86 while being presented with example window 100 (FIG. 5), the media title

American Psycho 112 (FIG. 5) is replaced in the highlighted title area 109 by the media title Dinosaur 122 as shown in FIG. 7. Thus it can be seen that as a user scrolls (in this example using the left and right arrows on the remove control device) through the indexing prompts, the media title list jump-scrolls to the first media title corresponding to the first indexing

5   parameter identified in the indexing prompt that is shown in the highlighted indexing area 105. In the case where such a media title is not available, then the first available media title corresponding to the next indexing parameter belonging to the highlighted indexing prompt is displayed in the highlighted title area 109. For example, if there were no available titles belonging to the media title list 107 that begin with the letter D, then a media title beginning

10   with the letter E would be displayed in the highlighted title area 109.

FIG. 8 depicts an example index browsing window 130 illustrating an alternative embodiment to the index browsing system illustrated in FIG. 5. In example window 130, the user is presented with a sub-list of titles such that the first alphanumeric character (A, B, or C) of each of the media titles shown in title list 107 corresponds to an indexing parameter (A,

15   B, or C) that is in the range of indexing parameters of the indexing prompt shown in the highlighted indexing area 105. In other words, the media title list includes only those titles belonging to the selected category 126 that match the highlighted indexing parameter . Therefore, the user would not be able to immediately use the up and down arrow buttons 83, 84 to access a media title starting with an alphanumeric character that does not belong to the

20   range of characters in the indexing prompt shown in the highlighted indexing area 105 (i.e. without first using the left or right arrow button 86 to change the highlighted indexing prompt). In example window 100 (FIG. 5), however, the user could use the up arrow button on the remote control device 80 to access a media title starting with an alphanumeric character, for example X, that does not currently belong to the range of characters in the

25   indexing prompt shown in the highlighted indexing area 105. This is because the title list 107 as described in example window 100 (FIG. 5) includes all media titles belonging to the selected category 126. One advantage to the embodiment illustrated in FIG. 8 is that a user can more quickly access media titles starting with an alphanumeric character, for example C, that is at the end of the range of alphanumeric characters shown in the highlighted indexing

30   area 105. Additionally, the number of titles the user can browse in the list 109 will likely be smaller and thus require less time to scroll through.

FIG. 9 depicts an example index browsing window 140 illustrating single parameter indexing. In this example, each indexing prompt, such as indexing prompt 141, only shows one indexing parameter. If there are no media titles that correspond to a certain indexing

parameter then such parameter is not shown in an indexing prompt. In this example, the letter X is shown in place of where the letter Y or Z would have been shown had there been any media titles belonging to title list 107 that begin with the letter Y or Z. In an alternative embodiment, all letters are shown. In this alternative embodiment when no titles

5   corresponding to a highlighted letter are available as part of title list 107, then a media title corresponding to the next letter (if available) is displayed in the highlighted title area 109. Single parameter indexing is used where the average number of titles corresponding to a single indexing parameter (such as an alphanumeric character) exceeds a predetermined threshold established by a headend system operator or where otherwise selected as a feature

10   of the index browsing system by a headend system operator, as discussed below.

FIG. 10 depicts an example index browsing window 150 illustrating variable range indexing prompts. In this example, the MOD client application 63 adjusts the range of each indexing prompt such that the number of media titles corresponding to the range of alphanumeric characters shown in each indexing prompt does not exceed a predetermined

15   threshold, as may be defined at the headend 11, as discussed below. For example if the number of media titles beginning with the letter A, B, or C is greater than a predetermined threshold, then the letter C is not included with the letters A and B in an indexing prompt. However, if the total number of media titles beginning with the letters A or B is less than the aforementioned predetermined threshold, then the letter B is included with the letter A in an

20   indexing prompt, such as indexing prompt 152. In example window 150, the number of media titles beginning with a letter belonging to a range shown in each of the indexing prompts 151, 152, or 153 is less than a predetermined threshold. In addition, the number of characters corresponding to each prompt is variable: indexing prompt 151 covers a range of 10 characters (0-9), indexing prompt 152 covers a range of 2 characters (A and B), and

25   indexing prompt 153 covers a range of 3 characters (C, D, and F). Each indexing prompt will include in its range the largest number of characters such that the predetermined threshold is not exceeded and such that no character is included in more than one indexing prompt. Of course, other embodiments include standard ranges or ranges that are set by a headend system operator as discussed below.

30   FIG. 11 depicts an example window 160 illustrating how the user can select different indexing criteria options. In one embodiment, example window 160 is presented to a user in response to the user activating the "C" button 90 (for "Change Index", such as in FIG. 10) on the remote control device 80 while being presented with an index browsing window. A center portion 161 of the window 160 contains an indexing criteria list 162 showing indexing

criteria, such as indexing criterion 163, and a highlighted indexing criteria area 164.
Example indexing criteria include, without limitation, movie rating, year of release, and
alphabetically by title, actor or director. A user may activate the up and down arrow buttons
83, 84 on the remote control device 80 in order to change the indexing criterion that is

5   displayed in the highlighted indexing criteria area 164. A user may then request the
highlighted indexing criterion by activating the select button 87 on the remote control device
80. For example, a user may select indexing criterion 163 by using the up arrow on the
remote control device 80 to cause the indexing criterion "By year of release" to become the
highlighted indexing criterion and by then activating the select button 87. Selecting an

10   indexing criterion will enable a user to browse through media titles that are indexed
according to such criterion.

FIG. 12 depicts an example index browsing window 170 illustrating index browsing
by a selected criterion. Title list 171 contains media entries, such as media entry 172, and
includes a highlighted entry area 173. Each media entry includes a media title and an

15   indexing criterion. In this example, the selected indexing criterion is "by year of release"
whereby media titles are indexed according to their respective release dates. A user may
activate the up and down arrow buttons 83, 84 on the remote control device 80 to scroll
through the list or the left and right arrow button 86s 85, 86 to jump-scroll through the list.
For example by activating the left arrow button 85, a user will cause the indexing prompt 174

20   (1999) to be shown in the highlighted indexing area 175 while causing the media entry shown
in highlighted entry area 173 to be a media title that was released in 1999 (As shown in FIG.
13). The same indexing functionality that applies to alphanumeric indexing can also be
applied to the numerical indexing shown in this example including single parameter indexing,
fixed range of years increments, and variable range indexing. For example, the indexing

25   prompts may each correspond to only one year or the length of the time period covered by the
range in each prompt may vary from one prompt to another depending on settings selected by
a headend system operator as discussed below.

FIG. 13 depicts an example index browsing window 180 illustrating a jump-scrolling
feature of the index browsing system illustrated in FIG. 12. Title list 171 contains media

30   entries, such as media entry 181, and includes a highlighted entry area 173. Example window
180 may be presented to a user who selects 1999 as an indexing parameter while being
presented with example window 170 (FIG. 12). By activating the left arrow button 85 while
being presented with example window 170, a user will cause the indexing prompt 174 to be
shown in the highlighted indexing area 105 while jump-scrolling through the title list 171

such that the media entry "American Beauty, 1999" 181 (FIG. 13) is shown in the highlighted entry area 173. In this manner, a parameter belonging to the indexing prompt shown in the highlighted indexing area 105 corresponds to he media entry shown in the highlighted entry area 173.

5   FIG. 14 depicts an example index browsing window 190 illustrating variable time period indexing prompts. Title list 171 contains media entries, such as media entry 192, and includes a highlighted entry area 173. In this example, the MOD client application 63 adjusts the time period covered by an indexing prompt such that the number of media titles originally corresponding to such time period does not exceed a predetermined threshold, as may be

10   defined at the headend 11, as will be discussed below. In one embodiment, media titles corresponding to parameters in the same indexing prompt, such as indexing prompt 191, are ordered alphabetically as shown in the top part 193 of title list 171. In an alternative embodiment, media titles corresponding to the same indexing prompt are ordered based on the indexing parameters in such indexing prompt. In this alternative embodiment, media

15   entries "Wild Wild West, 1999" 194 and "You've Got Mail, 1998" 195 would be interchanged such that the media entries corresponding to the parameter 1998 are listed above the media entries corresponding to the parameter 1999.

           FIG. 15 depicts an example window 200 illustrating browse-by and indexing criteria options, in accordance with an alternative embodiment. Example window 200 is presented to

20   a user in response to the DHCT 16 receiving user input corresponding to the "B" button 89 on the remote control device 80 while being presented with an index browsing window. The center portion 161 of the window 200 contains a browse-by categories list 202 showing browse-by categories, such as browse-by category 204, and a highlighted browsing category area 205. A user may request a highlighted browse-by category by activating the select

25   button 87 on the remote control device 80. A user may then use the right arrow button 86 on the remote control device 80 in order to have access to indexing criteria list 203 from which the user may select an indexing criteria. By selecting a browse by category and an indexing criterion, a user can have access to a specific category of media titles that is indexed in accordance to the selected indexing criteria. In this manner, the user can quickly and

30   conveniently locate media titles that the user may be interested in viewing. In an alternative embodiment, the browse-by category and the indexing criteria are presented and selected via separate windows.

           FIG. 16 depicts an example index browsing window 210 illustrating a selected category of media titles that is indexed in accordance with a selected indexing criteria.

Example window 210 is presented to a user after the user selects the "comedy" category 204 and the "by year of release" indexing criterion 206 while being presented with example window 200. In this example, the user is provided with comedy movie titles that are indexed by year of release so that the user can quickly and conveniently browse through the comedy

5   movie titles according to the years in which they were released.

FIG. 17 is a diagram of an example control menu window 220 for a headend system operator to configure the headend 11 illustrated in FIG. 2 to determine if and how the indexing system will be implemented in accordance with the present invention. In one embodiment, the control menu window 220 contains the options of whether the DHCT 16

10   would: activate the Indexing system, activate the sub-list feature, provide the user with alternative indexing criteria options, activate indexing with browse-by feature, and whether it would provide a uniform or variable number of indexing parameters in each indexing prompt.

The system operator may also make numerical entries for determining one or more of the following: the number of indexing parameters per uniform indexing prompt, the

15   maximum number of indexing parameters per variable indexing prompt, the maximum number of titles corresponding to the parameter(s) in a single prompt, the threshold for the average number of titles per indexing parameter required to activate single parameter indexing, and the threshold for the minimum number of titles required for activating the indexing system. The entries made and options selected by the system operator while being

20   provided with the control menu window 220 are communicated by the headend 11 to the DHCT 16 where they are implemented by the MOD client application 63.

In one embodiment, one or more of the indexing features described above are available to a user at a price. In another embodiment, indexing functionality is provided as part of an optional enhanced functionality package that includes other media-on-demand

25   functionality. In yet another embodiment, indexing functionality is available to a DHCT user at no extra charge.

It should be emphasized that the above-described embodiments of the present invention, particularly any "preferred embodiments", are merely possible examples of the implementations, merely setting forth a clear understanding of the principles of the

30   inventions. Many variations and modifications may be made to the above-described embodiments of the invention without departing substantially from the spirit of the principles of the invention. All such modifications and variations are intended to be included herein within the scope of the disclosure and present invention and protected by the following claims.

Therefore, having thus described the invention, the following is claimed: